

**Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, DC 20554**

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In the Matter of )  
)  
Advanced Television Systems )  
and Their Impact Upon the )  
Existing Television Broadcast )  
Service )  
  
Fifth Further Notice of )  
Proposed Rulemaking )

MM Docket No. 87-268

FEDERAL COMMUNICATIONS COMMISSION  
OFFICE OF SECRETARY

**COMMENTS OF GENERAL INSTRUMENT CORPORATION**

General Instrument Corporation ("GI") submits these comments in response to the Fifth Further Notice of Proposed Rulemaking ("NPRM"), FCC 96-207, released May 20, 1996. We generally support the comments of the Digital HDTV Grand Alliance, but submit these separate comments to emphasize specific issues.

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## **Summary of Position**

The time for Commission action to adopt the advanced television standard has arrived.

As we near the end of the lengthy road to advanced television standards, the Commission should complete the task it long ago set for itself and adopt the Advanced Television Systems Committee ("ATSC") documented standard.

By taking this action, the Commission will serve the public interest in helping to maintain a viable and technologically advanced national broadcast television system.

By taking this action, the Commission will keep faith with the thousands of stakeholders, both individual and institutional, who invested hundreds-of-thousands of man-hours and hundreds of millions of dollars at the Commission's invitation to develop the world's most advanced video distribution technologies.

By taking this action, the Commission will serve the public interest by honoring its commitments and the expectations they created. To do otherwise would be harmful for the U.S. broadcast industry, the implementation of digital broadcasting in the U.S., the international competitive position of U.S. digital television technology, and future efforts at collaboration between government and the private sector.

## **Adoption of An ATV Standard Will Benefit the Public**

We urge the Commission to adopt a standard for broadcast transmission of digital television. There is a strong consensus among key broadcast television

stakeholders, e.g., broadcasters, broadcast equipment manufacturers, and consumer electronics manufacturers, and others, that FCC adoption of a digital advanced television standard will serve the public interest by minimizing marketplace uncertainty, speeding the adoption of new consumer electronics technology, and allowing the Commission to more quickly retrieve the spectrum now used for analog TV broadcasting.

The Digital HDTV Grand Alliance system, as developed under the leadership of and recommended by the Commission's own Advisory Committee on Advanced Television Service (ACATS), and as documented and further embellished by the Advanced Television Systems Committee (ATSC) in ATSC documents A/52, A/53 and A/54, should become the U.S. standard for digital broadcast television. ACATS no longer exists and it is not clear that other bodies will be able to lead the industry and maintain the consensus as effectively in the absence of FCC action. And a competing digital television specification, developed primarily by foreign interests and lacking a design for transmitting high definition television and high quality surround-sound audio, has emerged as a serious contender to U.S. industry in non-broadcast market segments.

Over-the-air broadcast television in this country is a special service and has a special place in the nation's regulatory structure. It is a service with implications for interference. Importantly, it is a universal service, not a supplementary or elective service like DBS, cable TV or cellular telephone service. Consumers must have the assurance that they can tune from one channel to another and be able to receive all the broadcast stations in their service area. Adoption of a standard provides this assurance. Absence of a standard will create enough doubt in the minds of enough consumers that some will defer the

**purchase of new digital TV receivers. The result would be increased equipment costs, slower development of new equipment and new programming, and slower return of the analog TV channels.**

### **FCC Role in Standards Should Be Examined in Separate Proceeding**

**It is unfair to the public and to the stakeholder industries to now raise the question of the Commission's role in standards setting. NPRM, para. 29. There are indeed costs as well as benefits associated with standards. GI has been second to none in arguing that government should have a limited involvement in the establishment of standards. We have frequently warned of the dangers which such intervention has on innovation and development, particularly in dynamic industries.<sup>1</sup> Standards that are difficult to change may indeed freeze technology and stifle innovation. It is indeed possible to point to specific Commission-adopted standards that have had this effect. But this proceeding is not the proper forum to debate those policy issues and the universal broadcast system is not the place for application of a new policy.<sup>2</sup>**

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**1**Remarks by Daniel F. Akerson, Chairman and Chief Executive Officer, General Instrument Corporation at the Washington Metropolitan Cable Club Luncheon, Washington, D.C., April 11, 1995; Quincy Rodgers, "Interoperability, Standards and Security: Will the NII Be Based on Market Principles?" Paper Presented at the NII 2000 Forum, Computer Science & Telecommunications Board, National Academy of Sciences, May 22-24, 1995.

**2** The logic of limiting governments standard setting activities is turned upside-down when the Commission suggests that it will not adopt a broadcast standard but simultaneously proceeds to standardize receivers, as is the case with the decoder interface. (NPRM, Para. 65). Receiver development can, and therefore should, be left to the marketplace. As we pointed out in our comments in this proceeding, speaking of the similar issues raised by application of an all-channel receiver requirement:

**The All Channel Receiver Act is premised upon a particular model of a TV receiver, as a complete product designed for a single transmission medium. But the digital video marketplace of the future will be served by a variety of transmission media, and the public need may be best served by the modular design of video receivers, with a display that works for all transmission media but separate modules**

For the last nine years, the Commission, through its advisory committee, and the television industry, broadly defined, have collaborated to define an advanced broadcast television system. Industry has committed vast financial and manpower resources in the valid expectation that the Commission would adopt a standard for advanced television. Industry shouldered the burden of minimizing technical uncertainty with the expectation that the Commission would shoulder the burden of minimizing marketplace uncertainty. Would industry have made the same commitment in the absence of that expectation? Would the competing proponents of the four candidate all-digital ATV systems have joined together as the Grand Alliance in the absence of that expectation? We cannot be certain. We do believe, however, that the path to a single digital TV standard would have been much different if the stakeholders had not expected the Commission to adopt a standard.

We also believe, as confirmed by recent correspondence, that the Congress has had the expectation that the FCC would adopt an advanced television standard.

**"The transition to digital television service cannot begin, however, until the**

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that tune broadcast TV, cable, MMDS or satellite frequencies. Not all consumers will want all modules. Some may choose not to purchase the broadcast TV tuner module. The All Channel Receiver Act does not envision such options. Consumer choice serves the public interest; premature government regulation of TV receivers that eliminates this option could disserve the public interest.

The private sector is proceeding toward development of standards for cable television systems, and is addressing other issues of interoperability and compatibility of equipment. The Commission should refrain from regulatory intervention in market and private sector activity. *GI ATV Comments, Fourth Further Notice of Proposed Rulemaking and Third Notice of Inquiry, FCC 95-315, November 15, 1995, p. 17*

**Commission moves forward on several key decisions....These rules should include (1) rules establishing a broadcasting standard for terrestrial, over-the-air digital broadcasting....”<sup>3</sup>**

Perhaps the Commission should, as a general policy matter, decide to step back from its traditional role of adopting technical standards, including broadcast television. Or perhaps it should decide, after a full investigation, that FCC standards are needed for only certain universal broadcast services, while all others would benefit from the absence of FCC standards. Or perhaps it is the time delays and procedural burdens of the Administrative Procedures Act that are the culprits, and perhaps the Commission could delegate to industry standards bodies not only the writing of standards but the evolution of standards as well. These are all valid public policy questions, but deserve their own separate policy investigation. Debating them within the boundaries of Docket No. 87-268 is unfair both to those who care about the narrow but important goal of promptly deploying advanced television technology, and those who care about the broad public policy implications of standards but don't have much interest in the television industry.

### **ATSC Standard Supports Interoperability Without Limiting Flexibility**

There are several significant benefits of the Grand Alliance system, most notably the flexibility of system design and the ability to interoperate with a broad variety of media, services and technologies. The system provides a high speed digital channel to the home, a channel that can carry broadcast video and a variety of other services. It supports the special needs and special applications of non-broadcast industries, including cable, satellite and computer industries, and it does this in a flexible manner that can evolve over time.

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<sup>3</sup> Letter from Congressional Leadership to FCC Chairman Hundt, June 19, 1996.

The ATSC standard provides a high speed data pipe to the home that can deliver combinations of television programming ranging from a single action-oriented HDTV program to up to six movies rendered in standard definition in a 6 MHz broadcast channel. It can deliver medium speed ancillary data services while also carrying HDTV. It can carry high speed data services while at the same time carrying some SDTV video programs. It can carry more data during those periods when the video programming is relatively simple and motionless and thus requires a relatively lower data rate for the video. It can carry addressed data or broadcast data, e-mail messages or Internet Web pages or multimedia programming. The ATSC standard defines the methods for compressing and decompressing broadcast video, but provides total flexibility without any constraints in the carriage of these other services.

The ATSC standard supports both progressive scan and interlace scan transmissions and displays. It supports the special needs of the computer industry to transmit and display text and motionless graphics on television screens. To the extent the broadcast industry believes that interlace scan is the best way to use the 6 MHz TV channel to transmit live video programming, the ATSC standard permits that. We are amazed that some computer industry proponents, who have no stake whatsoever in the broadcasting industry, would presume to limit the flexibility of the ATSC standard and dictate technologies to be used by broadcasters. Imagine if the broadcast industry petitioned the FCC to regulate computer display formats, or DBS providers petitioned the FCC to limit telephone modem modulation methods. Some in the computer industry have claimed that future Americans will receive and view entertainment television via their computer systems. They are entitled to test that view in the marketplace and the ATSC standard provides the flexibility for them to do so. But that does not

justify placing limits on other providers which have implications for one competitor's preferences and constrain consumer choice.

Finally, the ATSC standard is highly interoperable with non-broadcast transmission media without limiting the flexibility of those media. While 8 VSB modulation was determined to be most suitable for broadcast television, satellite systems employing the same digital audio and video compression will use QPSK to maximize capacity and minimize interference, while cable TV will use 64 QAM and eventually 256 QAM because of the properties of its transmission medium. In this way, manufacturers can take advantage of maximum commonality of components without sacrificing the special benefits of different transmission media.

### **Adoption of ATV Standard Has International Trade Implications**

During the early years of the FCC's advanced television process, its implications for the international competitiveness of U.S. industry were well understood. It is arguable that they were the primary catalyst for the development of that process. The Japanese NHK/MUSE system was the sole candidate for delivering an advanced, high-resolution television system. U.S. technological competence was frequently questioned and failed government leadership was implicated for adding yet another threat to U.S. competitiveness and for allowing a replay of the loss of the U.S. television and VCR industries to control by foreign manufacturers. Worse still was the threat to the U.S. semiconductor industry, a key strategic industry which, it was argued, might stand or fall on the fate of HDTV and other high-resolution technologies.

In 1989 alone, eight different Congressional committees held eleven sets of hearings on the subject of high-definition TV. The West German



telecommunications commissioner proposed a joint U.S./EC effort to catch up with the Japanese. Agitation for a U.S. "industrial policy" was high, with one prominent and respected trade association calling for a \$1.35 billion government funded development program.<sup>4</sup>

Then, in June 1990, the first all-digital system was proposed for consideration as part of this FCC process.<sup>5</sup> Shortly thereafter, no less than four prototype systems were built and successfully tested, and an alliance of proponents was formed to finalize on a system incorporating the best features of each. American inventiveness had triumphed again!

Concern about the continuing international competitiveness of U.S. industry evaporated overnight; digital television was rightly recognized as a true advance over any technology under consideration in Europe or Asia. Here was an opportunity to regain a pre-eminent position for U.S. industry, based on the new technologies.

But just as the original threat had been overstated, the permanence of the international competitive benefits generated by these new U.S. technologies has been overestimated. Although digital television was invented in the U.S., by U.S. companies, Europeans have been quick to advance a competing standard, dubbed digital video broadcasting ("DVB"). It is inferior in several respects to the North

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<sup>4</sup> For valuable documentation on this period, see Cynthia A. Beltz, *High Tech Maneuvers, Industrial Policy Lessons of HDTV* (AEI Press, 1991).

<sup>5</sup> We note, with considerable pride, that this proposal was made by General Instrument Corp., whose engineers had concentrated on new techniques for digital compression to meet the competitive threat which MUSE posed to its satellite distribution systems.

American broadcast standard now before the Commission.<sup>6</sup> These shortcomings include the absence of a high-resolution mode, no support for progressive scan, and lesser audio capabilities. Nevertheless, DVB has already been adopted by the European Commission which has, thereby, established it as a competitor to the North American standard.

At stake are the markets of Latin America and Asia and the ability of companies advancing the North American standard to make inroads into those markets. At risk is the possibility that the North American standard could be isolated and American technology and services blocked or hindered in other markets.

At risk also are policies which seek to generate interoperability and compatibility. While identical standards across all distribution media are neither necessary nor wise (such as when different modulation methods are optimal for different media), the ATSC broadcast standard provides a high degree of similarity with evolving standards for other media, including cable television, MMDS, and direct-to-home satellite services. But despite some common elements, the DVB system is not interoperable with the ATSC broadcast standard. DVB advocates, despite access to the public information available through the Commission's processes, have gone their own way on key technical elements of that system.

Initial hopes that the European countries would work with the United States in the development of digital television have been dashed by the adoption of DVB. Clearly, Europe has once again chosen not to co-ordinate with the U.S. Europe has

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<sup>6</sup> ACATS included representatives of Mexico and Canada in its deliberations and both countries are poised to adopt the ATSC standard for digital broadcasting. In a very real sense, the ATSC standard is the North American standard.

a long history of initiating standardization efforts in the area of television technology, including PAL and SECAM in the 1960s, and Eurocrypt, D2MAC, DMAC and HD-MAC in the 1980's. The *bona fide* interest in establishing open standards frequently co-incides with the opportunity to promote European industrial interests.

In the face of this threat, the policy of the U.S. government should be clear and unambiguous. We believe that the U.S. government should help to ensure that the ATSC standard is a) finalized expeditiously; b) promoted, first throughout North America and then to South America and Asia; and c) supported in specific cases where DVB is threatening to make crucial inroads.

The first step in this process is for the Commission to finalize the ATSC standard in this proceeding expeditiously so that investment can flow for the benefit of the superior U.S. technologies. Here the Commission is not presented with a blank slate but is confronted by a set of circumstances in which it played a central role, in developing expectations and setting the guidelines for development. For the Commission to pull back from what has been widely and accurately touted as a remarkable process of consensus building will be misinterpreted by many as a rejection of the standard. It could have widespread ramifications for U.S. companies in markets around the world.

So long as the government continues to pursue an advocacy role on behalf of U.S. businesses, it can and should do no less than also advocate the superior technologies represented in the ATSC standard.

And finally, those who are advancing U.S. technologies are entitled to expect that the U.S. government will consider the effect of its actions and policy

choices on these technologies. U.S./Canadian co-operation has been a hallmark of the digital television process; the result has been a consensus North American broadcast standard. The choice of that standard by Canadian satellite interests planning to permit Canadian DBS slots to serve U.S. consumers would be a valuable element in further solidifying the competitiveness of U.S. industry. Yet four government agencies seem unaware of this effect as they have sought delay in the grant of an application for use of a Canadian DBS slot to serve U.S. consumers. This program of U.S./Canadian co-operation in the use of this DBS satellite slot would have likely insured the use of an ATSC compatible system; that is now jeopardized by delay or denial of the application. The Commission should grant the pending license applications for this service, and in so doing support and promote the ATSC system, even as it proceeds expeditiously to finalize the ATSC standard for broadcast television.

## **Conclusion**

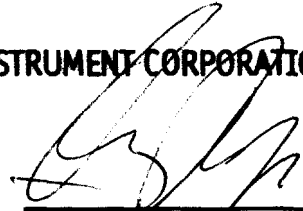
In light of these considerations, the Commission should follow the recommendations of the stakeholder industries and adopt the ATSC digital television specification as a United States standard. The public interest benefits

that will flow from this decision, including faster deployment of digital television and faster retrieval of analog television spectrum, far outweigh any costs.

Respectfully submitted,

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July 11, 1996

### **CERTIFICATE OF SERVICE**

I, Gerrit Craig Cone, certify that I have this 11th day of July 1996, caused to be delivered via first-class, postage prepaid mail, a true and correct copy of the foregoing Comments of General Instrument Corporation in the matter of Advanced Television Systems and Their Impact Upon the Existing Television Broadcast Service (Fifth Further Notice of Proposed Rulemaking) MM Docket No. 87-268, to the following:

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